**Practitioner's Docket No. 21604** **PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: David A. Culp

Application No.: 10/736,925 Group No.: 3643

Filed: 12/16/2003 Examiner: Timothy D. Collins

Confirmation No.: 5829

For: Improved Apparatus and Method for Aerodynamic Wing

**Commissioner for Patents**
**P. O. Box 1450**
**Alexandria, VA 22313-1450**

Sir:

**RESPONSE TO OFFICE ACTION UNDER 37 C.F.R. §1.111 AND REQUEST FOR CONTINUED EXAMINATION**

This paper is being filed in response to the Final Official Action mailed 12/01/2005. Reconsideration and continued examination are respectfully requested in light of the amendment and response under the requirements of 37 C.F.R. §1.111 and the fee required under 37 C.F.R. §§1.114 and 1.17(e), all submitted herein or herewith, and in consideration of the remarks below. Applicant's petition under 37 C.F.R. §§1.136(a) and 1.17(a)(1) for a one month extension of time and the required fee are likewise submitted herewith.

**AMENDMENT**

**In the Claims:**

Please amend the claims as set forth beginning on page 3 of this correspondence.

**REMARKS**

Applicant's remarks begin on page 12 of this correspondence.

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45. (New) Wind powered apparatus for transportation modes selected from the group consisting of watercraft, marine structures, skis, sail boards, land vehicles, dirigibles, aircraft, satellites, space craft, and nano-scale vehicles,

the apparatus consisting of:

at least one single layer aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, and consisting of a centerline, wingtips, and a tail corner; and

attachment means linking at least one aerodynamic wing to a transportation mode whereby wing function and transportation mode motion are controlled.

46. (New) The apparatus of claim 45, wherein the aerodynamic wing comprises a light weight, three dimensional wing consisting of a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing and into pure tension transferred to the attachment means, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

47. (New) The apparatus of claim 45, wherein the aerodynamic wing comprises a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over

leading edge of an airfoil, a trailing edge, a nose, wingtips, tail corner, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing and into pure tension transferred to the attachment means, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

48. (New) The apparatus of claim 46, wherein attachment means define axes in relation to the wing and transportation mode, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the wing, and airflow within, are controlled by independent manipulation of attachment means length.

49. (New) The apparatus of claim 48, wherein the wing further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

50. (New) The apparatus of claim 49, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the wing's centerline or near its nose on the wing's inside surface, and whereby the wing is rendered neutrally or negatively buoyant in air by the enclosure(s).

51. (New) The apparatus of claim 50, wherein the wing consists of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

52. (New) The apparatus of claim 47, wherein attachment means define axes in relation to the wing and transportation mode, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the wing, and airflow within, are controlled by independent manipulation of attachment means length.

53. (New) The apparatus of claim 52, wherein the wing further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

54. (New) The apparatus of claim 53, wherein each enclosure is torpedo shaped consisting of a lightweight, gas impermeable material attached to the wing's centerline or near its nose on the wing's inside surface, and whereby the wing is rendered neutrally or negatively buoyant in air by the enclosure(s).

55. (New) The apparatus of claim 54, wherein the wing consists of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along

or parallel to the wing centerline.

56. (New) A three-dimensional, aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, comprising:

a centerline;

wingtips;

a tail corner; and

a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

57. (New) A three-dimensional, aerodynamic wing capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, comprising:

a centerline;

wingtips;

a tail corner; and

a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the wing resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the wing, and whereby the wing profile of the wing approaching the trailing edge exhibits increasing convexity.

58. (New) An aerodynamic, three dimensional kite capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure, to replace downwind and cross wind sails on a sailing craft having at least one mast, comprising:

a centerline;

a plurality of tips;

a tail corner;

a plurality of gores of predetermined geometries, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the kite resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted

into tensile stress within the kite, and whereby the profile of the kite approaching the trailing edge exhibits increasing convexity; and

attachment means linking kite tips to points on the sailing craft other than a mast whereby kite function and sailing craft motion are controlled.

59. (New) The kite apparatus of claim 58, wherein attachment means comprises three flexible flying lines of predetermined adjustable length, each flying line comprising two ends, wherein for each flying line one end is affixed to a unique kite tip and the other end is affixed to a unique point on the sailing craft.

60. (New) The kite apparatus of claim 59, wherein the flying lines further define three axes in relation to the kite and sailing craft, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the kite, and airflow within, are controlled by independent manipulation of flying line length.

61. (New) The kite apparatus of claim 59, wherein the plurality of gores are secured and connected to form the three dimensional kite by first adhesively securing jointures between edge-to-edge gores using double-sided adhesive means, then sewn using flat overlapping seams and a zigzag

sewing stitch.

62. (New) The kite apparatus of claim 59, wherein the kite further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

63. (New) The kite apparatus of claim 62, wherein each enclosure is torpedo shaped consisting a lightweight, gas impermeable material attached to the kite's centerline or near its nose on the kite's inside surface, and whereby the kite is rendered neutrally or negatively buoyant in air by the enclosure(s).

64. (New) The kite apparatus of claim 63, wherein the kite further comprises of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

65. (New) An aerodynamic, three dimensional kite capable of flying with variable wind direction and angle of attack, without surface discontinuity, without stabilizing lines, without bridles, and without rigid structure to replace downwind and cross wind sails on a sailing craft, comprising:

a centerline;

a plurality of tips;

a tail corner;

a molded single continuous sheet of material, defining a large diameter self-supporting rolled-over leading edge of an airfoil, a trailing edge, a nose, an inside windward surface, and an outside leeward surface, whereby all stresses within the kite resulting from aerodynamic forces, gravity, and transient forces due to inertia are converted into tensile stress within the kite, and whereby the kite profile approaching the trailing edge exhibits increasing convexity; and

attachment means linking kite tips to points on the sailing craft other than a mast whereby kite function and sailing craft motion are controlled.

66. (New) The kite apparatus of claim 65, wherein attachment means comprises three flexible flying lines of predetermined adjustable length, each flying line comprising two ends, wherein for each flying line one end is affixed to a unique kite tip and the other end is affixed to a unique point on the sailing craft.

67. (New) The kite apparatus of claim 66, wherein the flying lines further define three axes in relation to the kite and sailing craft, and wherein roll and pitch, attitude, altitude, flying speed, angle of attack, internal pressure, and gross shape of the kite, and airflow within, are controlled by independent manipulation of flying line

length.

68. (New) The kite apparatus of claim 66, wherein the kite further consists of at least one variously shaped and sized enclosure containing a lighter than air gaseous mixture.

69. (New) The kite apparatus of claim 68, wherein each enclosure is torpedo shaped consisting a lightweight, gas impermeable material attached to the kite's centerline or near its nose on the kite's inside surface, and whereby the kite is rendered neutrally or negatively buoyant in air by the enclosure(s).

70. (New) The kite apparatus of claim 69, wherein the kite further comprises of at least two conjoined vaults or lobes of material with a projecting angle, or groin, between the conjoined vaults or lobes characteristically running partly or completely along or parallel to the wing centerline.

**REMARKS**

**Request for Information under 37 C.F.R. §1.105**

In the Office Action, the Examiner continued the prior request for required information under 37 C.F.R. §1.105. The Examiner's request in this regard was for the following information:

"i. Where exactly was the invention tested?

(1) What body of water was it used on, and where on the body of water? Coordinates or locations with respect to bodies of land are needed.

(2) When exactly was the device tested prior to December 19, 2002? Specific dates are needed.

(3) Who saw the testing being performed?

(4) What did the 'testing' and 'experimentation' consist of?

(5) Was any instance of the invention sold? For example was any specific single sail sold or offered for sail?" [Detailed Office Action, page 3 - 4].

Applicant files a supplemental declaration concurrently with this amendment and response, and incorporates herein by reference the statements of fact therein.

In pertinent part, these facts address the specific requests for additional information set forth above.

Additionally, Exhibits A-1, A-2, A-3, B-1 and B-2 provide

journalism entries as to the first public use of the present invention on 12/17/2002 and subsequent public use on 12/18/2002 in New Zealand.

**Information Disclosure Statement**

The Examiner's statement about non-patent and foreign patent references provided by the Applicant within the specification and/or in the previously filed Forms PTO/SB/08a and 08b are noted.

**Claim Rejections - 35 U.S.C. § 102**

The Examiner rejected Applicant's claims 1 - 5, 11 - 18, 31, 32 and 35 – 44 under 35 U.S.C. § 102(b).

Applicant has cancelled claims 1 - 44.

Filed with this amendment and response, and request for re-examination are new claims 45 - 70. Applicant respectfully submits Applicant's supplemental declaration and the above-presented new claims 45 - 70 remove any anticipation by either Kiteship 1 or U.S. Patent No. 4,296,704 to Briggs ("the '704 Patent").

**Claim Rejections - 35 U.S.C. §103(a)**

The Examiner has rejected claims 15 - 18 as being unpatentable over Kiteship 1 and/or in view of the '704 Patent.

Applicant has cancelled claims 1 - 44.

Filed with this amendment and response, and request for re-examination are new claims 45 - 70. Applicant respectfully

submits Applicant's supplemental declaration and the above-presented new claims 45 - 70 remove Kiteship 1 and/or the '704 Patent as 35 U.S.C. §103(a) references.

**CONCLUSION**

For all the reasons advanced above, applicant respectfully submits that the application is in condition for continued examination and allowance, and those actions are earnestly solicited.

Dated: March 24, 2006.

Respectfully submitted,
/Charles L. Thoeming/
Charles L. Thoeming
Registration No. 43,951
Customer No. 27015

Enclosures: 1) Form PTO/SB/21
2) Form PTO/SB/30
3) Form PTO/SB/22
4) Supplemental Declaration of David A. Culp with Exhibits A-1, A-2, A-3, B-1, and B-2 [16 pages]

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/Charles L. Thoeming/
Charles L. Thoeming, Registered Representative of Applicants
March 24, 2006
Date of Signature